

Patent Claims

1. A semiconductor component having the following features:

- a semiconductor body (20) with a substrate (22) of a first conduction type (p) and, situated above the latter, a first 5 layer (24) of a second conduction type (n),

- a channel zone (50) of the first conduction type (p) formed in the first layer (24), with a first terminal zone (40; 40A, 40B, 40C, 40D) of the second conduction type (n) arranged

10 adjacent to said channel zone,

- a second terminal zone (60) of the first conduction type (n) formed in the first layer (24) of the second conduction type,

15 - compensation zones (30,31) of the first conduction type (p) formed in the layer (24) of the second conduction type (n),

- a second layer (26) of the second conduction type (n) arranged between the substrate (22) and the compensation zones 20 (30,31).

2. The semiconductor component as claimed in claim 1, in which, in the first layer (24), a boundary zone (80) of the first conduction type extends in the vertical direction of the 25 semiconductor body (20).

3. The semiconductor component as claimed in claim 1 or 2, in which the boundary zone (80) reaches from the channel zone (50) as far as the substrate (22).

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4. The semiconductor component as claimed in claim 1 or 2, in which the boundary zone (80) is arranged spaced apart from the

channel zone (50) in the lateral direction of the semiconductor body (20).

5. The semiconductor component as claimed in claim 4, in
5 which the boundary zone (80) extends from a first surface of
the semiconductor body (20) as far as the substrate (22).

6. The semiconductor component as claimed in one of the
preceding claims, in which the compensation zones (30) are of
10 pillar-shaped design.

7. The semiconductor component as claimed in claim 6, in
which at least some of the compensation zones (30) adjoin the
channel zone (50).

15 8. The semiconductor component as claimed in one of the
preceding claims, in which the compensation zones (31) are of
spherical design.

20 9. The semiconductor component as claimed in one of the
preceding claims, in which second compensation zones (25) of
the second conduction type (n) are formed in the first layer
(24) adjacent to the compensation zones (30), the second
compensation zones being doped more heavily than the second
25 layer (24).

10. The semiconductor component as claimed in one of the
preceding claims, in which the boundary zone (80) is doped
more heavily than the substrate (22).

30 11. The semiconductor component as claimed in one of the
preceding claims, in which the second terminal zone (60) has a
section extending in the vertical direction of the
semiconductor body (20) as far as the second layer (26) and a

section extending at the level of the second layer (24) in the lateral direction.

12. The semiconductor component as claimed in claim 11, in
5 which the vertical section and the lateral section of the second terminal zone (60) enclose the first terminal zone (40; 40A, 40B, 40C, 40D) and at least some of the compensation zones (30) in a well-like manner.

10 13. The semiconductor component as claimed in one of the preceding claims, in which the number of dopant atoms of the first conduction type and the number of dopant atoms of the second conduction type in the first layer (24) are approximately identical.

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14. A semiconductor component having the following features:

- a semiconductor body (20) with a substrate (22) of a first conduction type (p) and, situated above the latter, a first layer (24) of a second conduction type (n),

- a boundary zone (80) of the first conduction type (p) which runs in the vertical direction of the semiconductor body (20) and reaches as far as the substrate and a second layer of the 25 second conduction type (n) which is formed between the layer (24) of the second conduction type (n) and the substrate and is doped more weakly than the first layer.